US-PAT-NO: 5835149

DOCUMENT-IDENTIFIER: US 5835149 A

TITLE: Bit allocation in a coded
video sequence

DATE-ISSUED: November 10, 1998

INVENTOR-INFORMATION:
NAME   CITY
      STATE   ZIP CODE   COUNTRY
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      NJ   N/A   N/A

APPL-NO: 08/ 881932

DATE FILED: June 25, 1997

PARENT-CASE:

    This application is a continuation of
application(s) Ser. No. 08/468,446
filed on Jun. 6, 1995, now abandoned.

US-CL-CURRENT: 375/240.05

ABSTRACT:

    A computer-implemented method and apparatus for
encoding video pictures of a
sequence of video pictures, wherein each picture is
defined by one picture type
of a plurality of picture types and each picture
has a complexity. According
to a preferred embodiment, the complexity of each
picture type is estimated to
provide a complexity estimate for each picture

type. Encoding a picture at an
average quantization level produces an encoded bit
stream having a codesize
related to the complexity of the picture, and each
picture type is associated
with a target codesize. An average quantization
level is determined for the
first picture of each picture type in accordance
with the target codesize and
complexity estimate of each of the first pictures,
respectively. The first
picture of each picture type is then encoded at its
respective average
quantization level. An actual average quantization
level at which each first
picture was actually encoded is determined, and the
complexity estimate for
each picture type is updated in accordance with the
actual average quantization
level and codesize of the first picture of the
picture type encoded.

29 Claims, 7 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 6

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Detailed Description Text - DETX (48):
   The local quantization level Q.sub.loc for the
current region of the current
picture may be selected using the following
equation: ##EQU3## where C is the
complexity of the current region, C.sub.ave is the
average complexity for the
current picture, Q is the average quantization
level for the current picture,

and R is a specified constant (preferably with a value of approximately 2).
Such a formula allows the quantization levels to vary from block to block
within each picture, where the constant R determines the magnitude of the
allowable variation. As will be understood, Q is set by rate controller 406
and varies from 1 to 31 in the MPEG-1 standard. Q varies on a logarithmic
scale in the MPEG-2 standard. Thus, Q is selected by rate controller 406 to
allocate bits between pictures, whereas rate controller 406 selects local
quantization level Q.sub.loc as part of local **rate control** to allocate bits
within a given picture.